



ELECTRO-OPTICAL SYSTEMS, INC.

300 N HALSTEAD ST., PASADENA, CALIFORNIA, 91107 • AREA CODE 213 681-4671 449 1230 • TWX 213 577-0060

A Subsidiary of Xerox Corporation

SUMMARY COST ESTIMATE

METALLIC VAPOR LAMP

PHASE I - SUMMARY

<u>DIRECT LABOR</u>	<u>HOURS</u>	<u>TOTAL</u>
Task I	2,198	\$10,531.
Task II	<u>940</u>	<u>4,454.</u>
Total Hours	3,138	
<u>TOTAL DIRECT LABOR</u>		\$14,985.
<u>OVERHEAD (133%)</u>		19,930.
<u>MATERIAL & SPECIALIZED COMPONENTS</u>		
Task I	\$ 805.	
Task II	<u>2,775.</u>	3,580.
<u>OTHER DIRECT COSTS</u>		
Task I		<u>525.</u>
<u>SUB TOTAL</u>		\$39,020.
<u>GENERAL & ADMINISTRATIVE (16.5%)</u>		<u>6,438.</u>
<u>TOTAL ESTIMATED COST</u>		\$45,458.
<u>FIXED FEE</u>		<u>4,319.</u>
<u>TOTAL</u>		\$49,777.

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SSUMMARY COST ESTIMATEMETALLIC VAPOR LAMPPHASE II - SUMMARYDIRECT LABORHOURSTOTAL

Task I	6,348	\$ 32,028.
Task II	<u>4,168</u>	<u>20,351.</u>
	Total Hours 10,516	

<u>TOTAL DIRECT LABOR</u>	\$ 52,379.
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<u>OVERHEAD (133%)</u>	69,664.
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MATERIAL & SPECIALIZED COMPONENTS

Task I	\$ 5,844.	
Task II	<u>6,500.</u>	12,344.

SPECIAL TEST EQUIPMENT OR TOOLING

Task I	600.	
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OTHER DIRECT COSTS

Task I	3,063.	
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<u>SUB TOTAL</u>	\$ 138,050.	
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<u>GENERAL & ADMINISTRATIVE (16.5%)</u>	<u>22,778.</u>	
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<u>TOTAL ESTIMATED COST</u>	\$ 160,828.	
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<u>FIXED FEE</u>	<u>15,278.</u>	
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<u>TOTAL</u>	\$ 176,106.	
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PHASE I - TASK I

<u>DIRECT LABOR</u>	<u>HOURS</u>	<u>RATE</u>	<u>TOTAL</u>
Chief Scientist VI	40	\$12.00	\$ 480.
Sr. Engineer IV	60	8.30	498.
Engineer III	340	6.75	2,295.
Engineer II	260	5.40	1,404.
Engineer Specialist	420	4.55	1,911.
Sr. Laboratory Technician	424	3.80	1,611.
Laboratory Technician	100	3.10	310.
Glass Blower	80	5.15	412.
Machinist	124	3.95	490.
Publications	200	3.35	670.
Secretarial	150	3.00	450.
<u>TOTAL DIRECT LABOR</u>	Total Hours 2,198		\$10,531.
<u>OVERHEAD (133%)</u>			14,006.

MATERIAL & SPECIALIZED COMPONENTS

See Attached List 805.

OTHER DIRECT COSTS

Subcontract: Lucalox Grinding, 5 @ \$96.00	\$480.
Telephone: 3 calls/20 min/Los Angeles - Washington	
\$13.70 + 10% = \$15.06 ea.	
\$15.06 x 3 =	<u>45.</u> <u>525.</u>

SUB TOTAL \$25,867.

GENERAL & ADMINISTRATIVE (16.5%) 4,268.

TOTAL ESTIMATED COST \$30,135.

FIXED FEE 2,863.

TOTAL \$32,998.

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SUMMARY COST ESTIMATE

METALLIC VAPOR LAMP

PHASE I - TASK I

MATERIALS LIST

<u>MATERIAL/DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
Lucalox 1" x 5"	10 pcs.	\$8.00/in + 2.00 cutting	\$420.
Molybdenum Rod Arc Cast 1/2	1 kg	43.50/kg	43.
Tungsten Rod 1/2"	2 kg	29.10/kg	58.
Liq. Nitrogen	5 cyl.	10.00/cyl	50.
Stainless Steel Plate			10.
Chem. Glassware			20.
Strip Chart Paper	5	5.45	27.
Helium			15.
Polaroid Film	10	4.00	40.
Tantalum Sheet Stock .010" 12"x 24"		43.00/lb.	15.
Tantalum Sheath Heaters	2 1/2'	10/ft.	25.
Tantalum Tubing 1/4"	2'	10/ft.	20.
Moly bar for jigging 1"	10	15/lb.	10.
Moly bar for jigging 3"		15/lb.	30.
Glass-metal seals 3/8"	2	6.00 ea.	12.
Stainless Steel Rod			10.
		Total	\$805.

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SCOST SUMMARY ESTIMATEMETALLIC VAPOR LAMPPHASE I-TASK II

<u>DIRECT LABOR</u>	<u>HOURS</u>	<u>RATE</u>	<u>TOTAL</u>
Engineer III	280	6.75	\$ 1,890.
Engineer Spec.	280	4.55	1,274.
Sr. Lab. Tech.	160	3.80	208.
Lab. Tech.	220	3.10	<u>682.</u>
<u>TOTAL DIRECT LABOR</u>	<u>940</u>		\$ 4,454.
<u>OVERHEAD (133%)</u>			<u>5,924.</u>
<u>MATERIAL & SPECIALIZED COMPONENTS</u>			
Scrs-Diodes	\$ 240.		
Pwr. Scrs.	1,035.		
Logk. circuit	300.		
Spares	1,000.		
Misc. Comp.	<u>200.</u>		<u>2,775.</u>
<u>SUB TOTAL</u>			\$ 13,153.
<u>GENERAL & ADMINISTRATIVE (16.5%)</u>			<u>2,170.</u>
<u>TOTAL ESTIMATED COST</u>			\$ 15,323.
<u>FIXED FEE</u>			<u>1,456.</u>
<u>TOTAL</u>			\$ <u>16,779.</u>



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COST SUMMARY ESTIMATE

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PHASE II-TASK I

<u>DIRECT LABOR</u>	<u>HOURS</u>	<u>RATE</u>	<u>TOTAL</u>
Chief Scientist	65	12.00	\$ 780.
Sr. Engineer IV	202	8.30	1,677.
Engineer III	1312	6.75	8,856.
Engineer II	1312	5.40	7,085.
Eng. Spec.	1090	4.55	4,960.
Sr. Lab. Tech.	824	3.80	3,131.
Lab. Tech.	424	3.10	1,314.
Glass Blower	180	5.15	927.
Machinist	400	3.95	1,580.
Publications	289	3.35	968.
Secretarial	250	3.00	750.
<u>TOTAL DIRECT LABOR</u>	<u>6348</u>		<u>\$ 32,028.</u>
<u>OVERHEAD (133%)</u>			<u>42,597.</u>
<u>MATERIAL & SPECIALIZED COMPONENTS</u>			<u>5,844.</u>

(See Attached Sheet)

SPECIAL TEST EQUIPMENT OR TOOLING

In Sb Liquid N ₂ Cooled Detector	\$ 600.
Santa Barbara Research	600.

OTHER DIRECT COSTS

<u>Travel</u>	
2 trips-2 men, 3 days L.A. to Washington	\$ 1,152.
Car	90.
12 days per diem	<u>336.</u>
(per diem - \$8 per day for meals plus \$20 per day Hotel)	1,578.

Communication

3 calls to L.A.-Wash.	\$45.00
	13.70 plus 10% = \$15.06
	ea. call
	15.06 x 3 = \$45.00
	45.



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COST SUMMARY ESTIMATE

METALLIC VAPOR LAMP

PHASE II-TASK I

<u>OTHER DIRECT COSTS (Cont.)</u>	<u>HOURS</u>	<u>RATE</u>	<u>TOTAL</u>
<u>Subcontracting</u>			
Lucalox Grinding 15 @ \$96.		\$ 1,440.	
<u>TOTAL OTHER DIRECT COSTS</u>			\$ 3,063.
<u>SUB TOTAL</u>			\$ 84,132.
<u>GENERAL & ADMINISTRATIVE (16.5%)</u>			<u>13,882.</u>
<u>TOTAL ESTIMATED COST</u>			\$ 98,014.
<u>FIXED FEE</u>			<u>9,311.</u>
<u>TOTAL</u>			<u>\$107,325.</u>



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PHASE II-TASK I

MATERIALS LIST

<u>MATERIAL/DESCRIPTION</u>	<u>TOTAL</u>
Lucalox 1" x 5"	\$ 210.
Lucalox 1½" x 5"	1,530.
Quartz for bell jars 100 mm bore	330.
Molybdenum Rod Arc Cast ½"	131.
Tungsten Rod ½"	154.
Niobium sheet 020" x 5" x 18" deep draw quality	110.
Thermocouples w/Re	43.
Cesium	100.
Argon	70.
Titanium Sheet	150.
Zirconium Sheet	150.
Vanadium Sheet	150.
OFHC Copper Tube	10.
Liq. Nitrogen	150.
Stainless Steel Pipe	40.
Stainless Steel Plate	90.
Stainless Steel Rod	40.
Acetone, Alcohol	150.
Chemical Cleaning	275.
Chemical Glassware	80.
Strip Chart Paper	109.
Helium	60.
Special Tools (Diamond Wheels, etc.)	250.
Poloroid Film	120.
Tantalum Sheet Stock .010" x 12" x 24"	80.
Tantalum Sheet Heaters	100.
Tantalum Tubing ¼"	80.
Bell Jar Base	100.
Moly Bar for jigging 1"	40.
Moly bar for jigging 3"	120.
Niobium Sheet 030" x 5" x 18"	55.
Glass-metal seals 3/8"	36.
Total	\$ 5,844.

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SUMMARY COST ESTIMATEMETALLIC VAPOR LAMPPHASE II - TASK II

<u>DIRECT LABOR</u>	<u>HOURS</u>	<u>RATE</u>	<u>TOTAL</u>
Engineer III	1,272	\$ 6.75	\$ 8,586.
Engineer Specialist	1,540	4.55	7,007.
Sr. Laboratory Technician	792.	3.80	3,010.
Laboratory Technician	564.	3.10	<u>1,748.</u>
Total Hours	4,168		
<u>TOTAL DIRECT LABOR</u>			\$20,351.
<u>OVERHEAD (133%)</u>			27,067.
<u>MATERIAL & SPECIALIZED COMPONENTS</u>			
Experimental Devices			
Experimental Devices	\$2,000.		
Electric Components	3,000.		
Rack and Chassis	1,000.		
Spare Parts	500.		<u>6,500.</u>
<u>SUB TOTAL</u>			\$53,918.
<u>GENERAL & ADMINISTRATIVE (16.5%)</u>			<u>8,896.</u>
<u>TOTAL ESTIMATED COST</u>			\$62,814.
<u>FIXED FEE</u>			<u>5,967.</u>
<u>TOTAL</u>			\$68,781.